Fresno General Plan Update Scenarios - CONFIDENTIAL DRAF	ă li
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2035 Annual Results	A. Revitalization, Infill, and Transit Corridors within SOI		B. Growth Area Development and Infill within SOI		C. Trend, Expands to SOI		D. Hybrid of A, B, and C		E. BIA Scenario	
	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff
SCENAR	A OI		В	0.020	C	33,7736	D	100.0		
End-State Total Population, 203			734,533		734,533				E	
End-State Total Households, 203			239,763				734,533		734,533	
Total Greenhouse Gas (GHG) Emissi			239,763		239,763		239,763		239,763	
otal Emissions (Transportation Combustion and Buildings) (MMT		-8%	2.22 MMT	-6%	2,36 MMT	1999				
ICE Fuel Combustion Emissions (MMT		-15%	1,01 MMT	-9%	1,12 MMT	0%	2.23 MMF	-6%	2.41 MMT	
Building Emissions (Residential and Commercial		-2%	1.21 MMT	-2%	1,24 MMT	0%	1,01 MMT	-10%	1.13 MMT	
12.2 (8 2.32)		-270	T ZI MMI	-270	1,24 (VIIVI)	0%	1.22 MMT	-2%	1.28 MMT	
Household Co										
Fuel and auto, energy, and water costs (2011\$		-1196	\$11,997	-8%	\$13,002	0%	\$12,007	-8%	\$13,143	
Household fuel and auto costs (2011\$		-15%	\$8,614	-9%	\$9,513	0%	\$8,570	-10%	\$9,607	
Household energy and water costs (2011\$	\$3,387	+3%	\$3,383	-3%	\$3,489	0%	\$3,437	-1%	\$3,536	
Land Consump										
Greenfield Land Consumed, Gross (sq mi		-31%	25.1 sq mi	-21%	31,7 sq mi	0%	25.7 sq mi	-19%	34.2 sq mi	
Greenfield Land Consumed, Gross (ac	13,909 ac	-31%	16,055 ac	-21%	20,263 ac	0%	16,435 ac	-19%	21,860 ac	
Transporta	ion									
VMT (miles	3.01 B mi	-15%	3,19 B mi	-9%	3,52 B mi	0%	3.17 B mi	-10%	3,56 B mi	
VMT per Hi	12,562 mi	-15%	13,306 mi	-9%	14,695 mi	036	13,238 mi	-10%	14,840 ml	
VMT per Capit	4,100 mi	-15%	4,343 ml	-9%	4,797 mi	0%	4,321 mi	-10%	4,844 mi	
Fuel Consumed (gal	121.7 M gal	-15%	128.9 M gal	-9%	142,4 M gal	0%	128,3 M gal	-10%	143,8 M gal	
Fuel Cost (2011\$	\$0.97 B	-15%	\$1,03 B	-9%	\$1,14 B	055	\$1.03 B	-10%	\$1.15 B	
Auto Ownership, Maintenance, and Additional Costs (2011\$	\$0.98 B	-15%	\$1.03 B	-9%	\$1.14 B	0%	\$1.03 B	-10%	\$1.15 B	
ICE Fuel Combustion Emissions (MMT	0.96 MMT	-15%	1.01 MMT	-9%	1,12 MMT	0%	1.01 MMT	-10%	1.13 MMT	
ICE Fuel Combustion Emissions per Capita (lbs	2,871 lbs	-15%	3,041 lbs	-9%	3,358 lbs	0%	3,025 lbs	-10%	3,392 lbs	
Criteria Pollutant Emissions (tons	3,717 tons	-15%	3,937 tons	-9%	4,347 tons	0%	3,917 tons	-10%	4,391 tons	
Public He	alth									
Annual Health Incidence	5,090	-15%	5 301	-9%	5 954	0%	5,364	-10%	6.013	
Annual Health Costs (2011\$	\$81,251,611	-15%	\$86,051,987	-9%	\$95,044,721	0%	\$85 624,000	-10%	\$95,983,03-	
Building End	ergy									
Residential Electricity Consumed (kWh		-3%	1,576 GWh	-3%	1,633 GWh	0%	1.605 GWh	-2%	1,658 GWh	
Residential Natural Gas Consumed (therms		-2%	83,354,420 thm	-2%	84,683,320 thm	0%	84,044,368 thm	-1%	85,279,833 thm	
Residential Energy Consumed (Btu		-2%	13.7 tril Btu	-2%	14.0 tril Btu	0%	13.9 tril Btu	-1%	14.2 tril Btu	
Commercial Energy Consumed (Btu		-3%	7.9 tril Btu	-3%	8.1 tril Btu	0%	7.8 tril Btu	-3%	8.1 tril Btu	
Total Energy Consumed (Btu		-2%	21.6 tril Btu	-2%	22.1 tril Btu	0%	21.7 tril Btu	-2%	22.3 tril Btu	
Residential Building Emissions (MMT	0.76 MMT	-2%	0.76 MMT	-2%	0.78 MMT	0%	0.77 MMT	-1%	0.79 MMT	
Commercial Building Emissions (MMT	0.45 MMT	-3%	0_45 MMT	-3%	0.46 MMT	0%	0.45 MMT	-3%	0.46 MMT	
Residential Electricity per HH (kWh	6,583 kWh	-3%	6,573 kWh	-3%	6,809 kWh	0%	6,693 kWh	-2%	6,915 kWh	
Residential Natural Gas per HH (therms) 348 thm	-2%	348 thm	-2%	353 thm	0%	351 thm	-1%	356 thm	
Residential Energy Use per HH (Btu	90.0 mil Btu	-2%	90_0 mil Btu	-2%	92.2 mil Btu	0%	90,6 mil Btu	-2%	92.8 mil Btu	
Residential Energy Cost (\$	\$678 mil	-3%	\$677 mil	-3%	\$698 mil	0%	\$688 mil	-2%	\$708 mil	
Residential Energy Cost per HH (\$	\$2,826	-3%	\$2,822	-3%	\$2,913	0%	\$2,868	-2%	\$2,954	
W	ater									
Water Consumed (AF		-3%	93,501 AF	-3%	96,249 AF	0%	94,912 AF	-1%	97,484 AF	
Water Cost (\$		-3%	\$135 mit	-3%	\$138 mil	0%	\$136 mil	-1%	\$140 mil	
Water Consumed per HH (ga	1	-3%	127,074 gal	-3%	130,808 gal	0%	128,991 gal	-1%	132,486 gal	
Residential Water Cost per HH (\$	\$562	-3%	\$561	-3%	\$576	0%	\$569	-1%	\$583	
Water Consumed for new households only (Al) 29,127 AF	-9%	29,367 AF	-9%	32,115 AF	0%	30,778 AF	-4%	33,349 AF	
Water use per new HH (ga) 103,367 gal	-9%	104,221 gal	-9%	113,971 gal	0%	109,227 gal	-4%	118,353 gal	
Water cost per for new HH (20115	\$38,437,223	-8%	\$38,306,989	-9%	\$41,890,831	0%	\$40,146,823	-4%	\$43,501,350	
Water cost per new HH (2011)	\$419	-8%	\$417	-9%	\$456	0%	\$437	-4%	\$474	
Infrastructure (Cumulative results to 2	035)									
Cumulative Infrastructure Cost (2011)	\$1.27 B	-10%	\$1,33 B	-6%	\$1.41 B	036	\$1.35 B	-4%	\$1.38 B	
110/A 11/4 (05/A A 00/00/A 04/05/40/	' \									
Cumulative Operations & Maintenance Cost (2011)	1	-6%	\$0,31 B	-5%	\$0,32 B	0%	\$0.31 B	-3%	\$0.32 B	
Cumulative Revenues (2011)	\$4.62 B	2%	\$4.48 B	-1%	\$4.51 B		\$4.60 B	2%	\$4.34 B	

	ASSUMPTIONS	Rapid Fire calculated baseline
rom C	(Same assumptions used for all scenarios)	2005
	Growth projections assume 79,000 new units and 125,000 new jobs (by 2035, relative to 2010) for ALL scenarios.	Baseline 454,736 147,945
% % %	Transportation GHG emissions include CO2-equivalent (CO2e) from passenger vehicle fuel combustion. Building emissions include CO2e from residential and commercial electricity and natural gas use.	2.4 MMT 1,1 MMT 1,3 MMT
6	Household costs reflect averages for ALL households (including existing households), expressed in 2011 dollars. Specific cost assumptions are further detailed below.	
% %	Land consumption estimated based on per-capita rates, which vary by Land Development Category and are calibrated to past development patterns.	
% % %	 All transportation results assume modest improvements in fuel economy (27 mpg by 2035), and LCFS-based emissions (A 10% reduction, or ~17.3 lbs CO2e/gal by 2035). 	2.3 B mi 15,498 mi 5,042 mi 0.1 B gal
% % %	Fuel cost assumed to reach \$8 per gallon by 2035. (2011\$) Auto ownership and maintenance costs assumed to be \$0.32 per mile (2011\$).	1 MMT 5,120 lbs
6	Per-mile criteria pollutant emissions rates from EMFAC 2007.	87,578 tons
% %	Estimated based on tons of criteria pollutants emitted. Health incidence and valuation assumptions developed by TIAX for the American Lung Association (Oct 2011).	Note: Express health impacts and costs only as DIFFERENCES between scenarios
% % %	Residential electricity and natural gas use for new units based on CEC RASS data by residential type, for Fresno's climate zone (Title 24 zone 13). Average energy use for existing units (7,860 kWh/unit and 420 thm/unit) based on normalized monthly usage for the City of Fresno, as treported by FG&E to the COF.	(e.g., Compared to Scenario C, Scenario A would result in \$13.8 million less in health
6	Commercial energy use for new and existing buildings based on average energy intensity of all commercial floorspace in Fresno's climate zone (CEC Forecasting Zone 3) - 12.8 kWh/sq ft; 0.27 thm/sq ft. Note that commercial energy use does not comprise all "non-residential" use, as it does not include industrial energy use	costs in 2035).
% % %	Electricity emissions: 0.45 lbs/kWh in 2035 per Ssutainable Fresno Division based on input from PG&E. Natural gas emissions: 11.7 lbs/therm state average (no change, since emissions are constant).	
% %	Electricity cost: \$0.35 in 2035; natural gas cost: \$1.50 per therm by 2035 (2011\$). Per Sustainable Fresno Division, March 2012.	
% %	Water use based on average per-capita indoor water use rotes, and outdoor rates based on Fresno's evapotranspiration zone and assumptions about lot size and irrigated area.	
% % % %	Water cost: \$1,500 per acre-foot (2011\$), per Sustainable Fresno Division.	
%	Infrastructure costs are one-time costs that include the construction of streets, parks, water,	
!%	and wastewater infrastructure. Operations and maintenance costs are ongoing costs that are incurred annually to maintain that infrastructure. Costs vary by dwelling unit type. Totals reflect cumulative costs to 2035.	
1%	DATE CHINA ALL MANAGEMENTS AND ALL MANAGEMENTS	

Rapid Fire calculated baseline 2005 Baseline 454,736 147,945 2.4 MMT 1,1 MMT 1.3 MMT 2.3 B mi 15,498 mi 5,042 mi 0.18 gal 1 MMT 5,120 lbs 87,578 tons

5-Apr-12 A. Revitalization, Infill, a			B. Growth Area Development and					THE RESERVE TO SHARE	Contract on		
2035 Annual Results	Transit Corridors within SOI		Infill within SOI		C. Trend, Expands to SOI		D. Hybrid of A, B, and C		E. BIA Scenario		
	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff from Alt C	Result	Diff from Alt A	Diff from Alt
SCENARIO		A		В	(D	.2008(978)	E	-372
End-State Total Population, 2035	734,533		734,533	•	734,533	-	734,533		734,533	-	
End-State Total Households, 2035	239,763		239,763		239,763		239,763		239,763		
Total Greenhouse Gas (GHG) Emissions			100,100		235,700		200,700		233,703		
al Emissions (Transportation Combustion and Buildings) (MMT)	2.17 MMT	-0.19 MMT	2.22 MMT	-0.14 MMT	2.36 MMT	0.00 MMT	2.23 MMT	-0.13 MMT	2.41 MMT	0.24 MMT	0.05 MMT
ICE Fuel Combustion Emissions (MMT)	0.96 MMT	-0.16 MMT	1.01 MMT	-0.11 MMT	1.12 MMT	D.00 MMT	1.01 MMT	-0.11 MMT	1.13 MMT	0.17 MMT	0.03 MMT
3 Print 6 Print 200 March 200 Print	1.21 MMT	-0.03 MMT	1.21 MMT	-0.03 MMT	1.24 MMT	0.00 MMT	1.22 MMT	-0.02 MMT	1.28 MMT	0.07 MMT	0.04 MM
Building Emissions (Residential and Commercial)	T-ZT IVIIVII	-0.03 MMM	T'ST MIMI	-0.03 (4)(4)	7 54 1411411	0.00 (((()))	T-22 MIMI	-0,02 1911911	T-20 IVIIVI	G.O7 IVIIVIT	0.04 141141
Household Costs	444.500	Å4 400	ALL DOD	44 005	*** ***	20			2002/002	4	
Fuel and auto, energy, and water costs (2011\$)	\$11,520	-\$1,482	\$11,997	-\$1,005	\$13,002	\$0	\$12,007	-\$995	\$13,143	\$1,624	\$142
Household fuel and auto costs (2011\$)	\$8,132	-\$1,381	\$8,614	-\$899	\$9,513	50	\$8,570	-\$943	\$9,607	\$1,475	\$94
Household energy and water costs (2011\$)	\$3,387	-\$102	\$3,383	-\$106	\$3,489	\$0	\$3,437	-\$52	\$3,536	\$149	\$47
Land Consumption											
Greenfield Land Consumed, Gross (sq mi)	21.7 sq mi	-9.9 sq mi	25.1 sq mi	-6.6 sq mi	31.7 sq mi	0 sq mr	25.7 sq mi	-6.0 sq mi	34.2 sq mi	12.4 sq mi	2 5 sq mi
Greenfield Land Consumed, Gross (ac)	13,909 ac	-6,354 ac	16,055 ac	-4,207 ac	20,263 ac	ac.	16,435 ac	-3,828 ac	21,860 ac	7,951 ac	1,597 ac
Transportation			1								
VMT (miles)	3.01 B mi	-0.51 B ml	3.19 B mi	-0.33 B mi	3,52 B mi	0 00 B mi	3.17 B mi	-0.35 B mi	3,56 B mi	0.55 B mi	0.03 B mi
VMT per HH	12,562 mi	-2,133 mi	13,306 mi	-1,389 mi	14,695 mi	m	13,238 mi	-1,457 mi	14,840 mi	2,278 mi	146 mì
VMT per Capita	4,100 mî	-696 ml	4,343 ml	-453 ml	4,797 mî	7(7)\$	4,321 ml	-475 ml	4,844 mi	744 mi	48 mi
Fuel Consumed (gal)	121.7 M gal	-20.7 M gal	128.9 M gal	-13.5 M gal	142,4 M gal	0.0 M gal	128,3 M gal	-14.1 M gal	143.8 M gal	22.1 M gal	1.4 M ga
Fuel Cost (2011\$)	\$0,97 B	-\$165 M	\$1.03 8	-\$108 M	\$1.14 B	>0 M1	\$1.03 B	-\$113 M	\$1.15 B	\$177 M	\$11 M
Auto Ownership, Maintenance, and Additional Costs (2011\$)	\$0.98 B	-\$166 M	\$1.03 B	-\$108 M	\$1.14 B	507/1	\$1.03 B	-\$113 M	\$1.15 B	\$177 M	\$11 M
ICE Fuel Combustion Emissions (MMT)	0.96 MMT	-0.16 MMT	1.01 MMT	-0,11 MMT	1.12 MMT	TMM 50.0	1-01 MMT	-0.11 MMT	1,13 MMT	0.17 MMT	0.01 MM
ICE Fuel Combustion Emissions per Capita (lbs)	2,871 lbs	-487 lbs	3,041 lbs	-317 lbs	3,358 lbs	O lbs.	3,025 lbs	-333 lbs	3,392 lbs	521 lbs	33 lbs
Criteria Pollutant Emissions (tons)	3,717 tons	-631 tons	3,937 tons	-411 tons	4,347 tons	tons	3,917 tons	-431 tons	4,391 tons	674 tons	43 tons
Public Health:											
Annual Health Incidences	3,090	-864	5.301	-563		0	5,364	-590	3,013	923	59
Annual Health Costs (2011\$)	\$81,251 611	-\$13,793,110	185 081,987	-\$8,982,734	59-04-721	50	\$85,624,000	-\$9,420,721	\$95,988 034	\$14,736,423	\$943,313
Building Energy											
Residential Electricity Consumed (kWh)	1,578 GWh	-54 GWh	1,576 GWh	-57 GWh	1,633 GWh	0 GV F	1,605 GWh	-28 GWh	1,658 GWh	79 GWh	25 GWh
Residential Natural Gas Consumed (therms)	83,402,521 thm	-1,280,799 thm	83,354,420 thm	1,328,900 thm	84,683,320 thm	0 thm	84,044,368 thm	-638,952 thm	85,279,833 thm	1,877,312 thm	596,513 th
Residential Energy Consumed (Btu)	13,7 tril Btu	-313 bil Btu	13.7 tril Btu	-326 bil Btu	14.0 tril Btu	D. Trib Big	13.9 tril Btu	-159 bil Btu	14.2 tril Btu	459 bil Btu	146 bil Bt
Commercial Energy Consumed (Btu)	7,8 tril Btu	-219 bil Btu	7.9 tril Btu	-210 bil Btu	8.1 tril Btu	2.5 tr + Bru	7.8 tril Btu	-221 bil 8tu	8.1 tril Btu	226 bil Btu	6 bil 8tu
Total Energy Consumed (Btu)	21,6 tril Btu	-532 bil Btu	21.6 tril Btu	-536 bil Btu	22.1 tril Btu	0 O tr Feb.	21.7 trii Btu	-381 bil Btu	22.3 tril Btu	685 bil Btu	152 bil Bt
Residential Building Emissions (MMT)	0.76 MMT	-0.02 MMT	0.76 MMT	-0.02 MMT	0.78 MMT	P.05 : 15/4T	0.77 MMT	-0.01 MMT	0.79 MMT	0.03 MMT	0.01 MM
Commercial Building Emissions (MMT)	0.45 MMT	-0.01 MMT	0.45 MMT	-0.01 MMT	0.46 MMT	C0.1 VM 7	0.45 MMT	-0.01 MMT	0.46 MMT	0.01 MMT	0.00 MM
Residential Electricity per HH (kWh)	6,583 kWh	-226 kWh	6,573 kWh	-236 kWh	6,809 kWh	ot n	6,693 kWh	-117 kWh	6,915 kWh	331 kWh	105 kWh
Residential Natural Gas per HH (therms)	348 thm	-5 thm	348 thm	-6 thm	353 thm	O that	351 thm	-3 thm	356 thm	8 thm	2 thm
Residential Energy Use per HH (Btu)	90.0 mil Btu	-2.2 mil Btu	90.0 mil Btu	-2.2 mil Btu	92,2 mil 8tu	0.0 mil 8ta	90,6 mil Btu	-1,6 mll Btu	92,8 mil Btu	2,9 mil Btu	0.6 mil Bt
Residential Energy Cost (\$)	\$678 mil	-\$21 mil	\$677 mil	-\$22 mil	\$698 mil	SCITHE	\$688 mil	-\$11 mil	\$708 mil	\$31 mil	\$10 mil
Residential Energy Cost per HH (\$)	\$2,826	-\$87	\$2,822	-\$91	\$2,913	7.	\$2,868	-\$45	\$2,954	\$128	\$41
Water	1										
Water Consumed (AF)	93,261 AF	-2,988 AF	93,501 AF	-2,747 AF	96,249 AF	Ar	94,912 AF	-1,337 AF	97,484 AF	4,223 AF	1,235 AF
Water Cost (\$)	\$135 mil	-\$3.5 mil	\$135 mil	-\$3.6 mil	\$138 mil	SO G mil	\$136 mil	-\$1.7 mil	\$140 mil	\$5.1 mil	\$1.6 mil
Water Consumed per HH (gal)	126,747 gal	-4,061 gal	127,074 gal	-3,734 gal	130,808 gal	gai.	128,991 gal	-1,817 gal	132,486 gal	5,739 gal	1,678 ga
Residential Water Cost per HH (\$)	\$562	-\$14	\$561	-\$15	\$576	>-	\$569	-\$7	\$583	\$21	\$7
Water Consumed for new households only (AF)	29,127 AF	-2,988 AF	29,367 AF	-2,747 AF	32,115 AF	AF	30,778 AF	-1,337 AF	33,349 AF	4,223 AF	1,235 Al
Water use per new HH (gal)	103,367 gal	-10,605 gal	104,221 gal	-9,750 gal	113,971 gal	gal	109,227 gal	-4,745 gal	118,353 gal	14,986 gal	4,382 ga
Water cost for new HH (2011\$)	\$38,437,223	-\$3,453,608	\$38,306,989	-\$3,583,842	\$41,890,831	\$0	\$40,146,823	-\$1,744,008	\$43,501,350	\$5,064,127	\$1,610,5
Water cost per new HH (2011\$)	\$419	-\$38	\$417	-\$39	\$456	\$0	\$437	-\$19	\$474	\$55	\$18
Infrastructure (Cumulative results to 2035)											
· ·	\$1.27 B	-\$143 M	\$1.33 B	-\$80 M	\$1.41 B	3313	\$1.35 B	-\$63 M	\$1.38 B	\$115 M	-\$27 M
Cumulative Infrastructure Cost (20115)	3										
Cumulative Operations & Maintenance Cost (20115)	\$0.30 B	-\$20 M	\$0.31 B	-\$17 M	\$0.32 B	68-51	\$0.31 B	-\$11 M	\$0.32 B	\$13 M	-\$7 M
Cumulative Revenues (\$)	\$4.62 B	\$109 M	\$4.48 B	-\$27 M	\$4.51 B	30.11	\$4.60 B	\$90 M	\$4.34 B	-\$278 M	-\$169 M

EQUIVALENCIES EQUIVALENCIES Alt A compared to Alt E Alt A compared to Alt C (Same assumptions used for all scenarios) (Same assumptions used for all scenarios) **GREENHOUSE GAS EMISSIONS GREENHOUSE GAS EMISSIONS** Reduces total annual GHGs by the same amount sequestered by 78,000 acres of Reduces total annual GHGs by the same amount sequestered by 98,000 acres of trees -- or 5 million tree seedlings grown for 10 years. trees -- or 6.2 million tree seedlings grown for 10 years. HOUSEHOLD COSTS HOUSEHOLD COSTS \$1,620 savings per household, per year in auto and utility costs \$1,480 savings per household, per year in auto and utility costs. LAND CONSUMPTION LAND CONSUMPTION 12.4 square miles of land saved. Nearly 10 square miles of land saved. TRANSPORTATION TRANSPORTATION Nearly 44,000 cars off Fresno's roads. Over 40,000 cars off Fresno's roads. 21 million gallons less fuel consumed in 2035 -- over 2,400 tanker trucks' worth of 22 million gallons less fuel consumed in 2035 -- nearly 2,600 tanker trucks' worth of gas, or over a million barrels of oil. gas, or over 1.1 million barrels of oil. HEALTH IMPACTS HEALTH IMPACTS \$13.8 million less in healthcare spending for air pollution-related illnesses in 2035. \$14.7 million less in healthcare spending for air pollution-related illnesses in 2035. ENERGY ENERGY Enough energy saved annually to power over 9,000 homes. Enough energy saved annually to power 11,700 homes. WATER WATER Enough water saved annually to serve over 7,500 homes. Enough water saved annually to serve over 10,400 homes. Over 10,000 gallons saved per new household. Nearly 15,000 gallons saved per new household INFRASTRUCTURE COSTS INFRASTRUCTURE COSTS \$162 million less in local spending to build, operate, and maintain infrastructure by \$115 million less in local spending to build, operate, and maintain infrastructure by 2035. 2035.